Compiling MATLAB Scripts into Executables to Reduce the Use of Licenses

NAS currently has 16 MATLAB licenses available. To avoid overwhelming the license server, and to reduce contention for the limited number of licenses, PBS batch jobs running on Pleiades are not allowed to query the MATLAB license server. Therefore, in order to run a MATLAB script in a batch job on Pleiades, you must first compile the script. Compiled executables do not access the license server.

Note: It is not necessary to compile your MATLAB scripts for batch jobs running on the LDANs or Endeavour—on these systems, there is less risk of overwhelming the MATLAB license server because fewer hosts query the server. Also, you can still run interactive MATLAB jobs on Pleiades without compiling the scripts (it is easier to debug the scripts if they are not compiled into executables).

Steps for Compiling a MATLAB Script

This method is the simplest way to compile a MATLAB script into a standalone executable. The steps are described using the following sample script, findR.m:

```
function R = findR
% findR - given data T, calculate R
%
T = 10;
R = .5*(-9.8)*T
% end of MATLAB code
```

Complete these steps to compile the sample script:

1. Load the modules:

   ```
   % module load matlab
   % module load gcc/4.7.3 # or later
   ```

2. If this is the first time you are using MATLAB to create an executable, run:

   ```
   % matlab -nodisplay
   >>mbuild -setup
   >>exit
   ```

3. Compile the script into an executable. At the Linux or MATLAB prompt, run:

   ```
   % mcc -m findR.m -o findR
   ```

   Two files are created:
   - An executable: findR
   - A shell script: run_findR.sh
4. To run the executable, add the following lines to your PBS script or run them at the Linux prompt:

   ```
   % module load matlab/2016b
   % module load gcc/4.7.3
   ./run_findR.sh $MATLAB
   ```

   The output will be:

   ```
   % ./run_findR.sh $MATLAB
   ----------------------------------------
   Setting up environment variables
   ---
   LD_LIBRARY_PATH is
   .:/nasa/mw/2016b/runtime/glnxa64:/nasa/mw/2016b/bin/glnxa64:/nasa/mw/20
   14b/sys/os/glnxa64:/nasa/mw/2016b/sys/opengl/lib/glnxa64
   R =
     -49
   ```

Note: If you have several MATLAB scripts, where master.m calls y.m, and y.m calls z.m, make sure that master.m is the first file listed in the command line when you compile the script:

```
% mcc -m master.m y.m z.m
```

In this case, the resulting files are:

- Executable: master
- Shell script: run_master.sh

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